Development of ENERGY STAR Benchmarking Criteria for Retail Buildings:

Progress Report and Results for [Company]

1. Introduction

Portfolio Manager (PM) is an energy performance rating system that helps energy managers assess how efficiently their buildings use energy, relative to similar buildings nationwide. EPA, in conjunction with stakeholders, developed the national energy performance rating as a screening tool to help organizations identify those buildings that offer the best opportunities for improvement and recognition. A PM overview is available at: http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager.

-Insert Paragraph on Energy Star from Brian and Stuart

ICF International is assisting EPA to develop a national energy performance rating for retail buildings; i.e., buildings that are primarily used for retail sales of consumer products. As part of this work, ICF International received data on more than 600 retail buildings from nine companies. This paper presents the current status of the proposed benchmarking methodology for retail buildings, and presents results for **[Company]**. These results are confidential, and only being shared with **[Company]**. Based on feedback from all the companies, a final methodology will be recommended to EPA for use in PM.

This paper is organized as follows:

- Section 2 presents the benchmarking methodology developed for retail buildings.
- Section 3 presents the results for **[Company]**.
- Section 4 compares the results for **[Company]** to the results from the other companies that provided data for this assessment.
- Section 5 presents a brief conclusion.

2. Proposed Benchmarking Methodology for Retail Buildings

EPA's national energy performance rating, housed within PM, is designed to perform a numerical evaluation of a building's energy efficiency. This evaluation is performed by comparing a single building's energy consumption to the consumption of similar buildings nationwide. The energy performance of a building is expressed on a 1-to-100 scale — a rating of 50 indicates that the building performs better than 50% of all similar buildings, while a rating of 75 indicates that the building performs better than 75% of all similar buildings.

To produce this rating, PM uses a benchmarking methodology based on linear regression models developed specifically for each type of building that can be rated (i.e. Office, K-12 School).[1] The benchmarking methodology must accomplish two tasks:

> Task 1 – Must control for variations in building characteristics (such as size, operating hours, and weather) so that an individual building is compared to similar buildings on an equitable basis.
>
> Task 2 – Must represent the distribution of performance of buildings nationally so that the performance of an individual building can be compared to the national distribution of buildings.

To accomplish these two tasks, a statistically representative dataset describing commercial buildings and their energy use is required. The Department of Energy, Energy Information Administration quadrennial Commercial Building Energy Consumption Survey (CBECS) provides such a dataset, and is consequently used to develop the PM benchmarking regression models.

[1] The benchmarking models used in PM are described at: http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager_model_tech_desc.

The CBECS data are collected through a survey of buildings throughout the U.S. The data include detailed building characteristics, many of which may be examined to identify key factors that drive building energy consumption. A small sampling of some of the relevant building characteristics included in the CBECS dataset is presented in Exhibit 1. The most recent CBECS survey was performed in 2003, and the 2003 data were used to develop the proposed benchmarking methodology for retail buildings.[2]

2.1 Controlling for Variations in Building Characteristics

To accomplish Task 1, EPA and ICF International performed regression analysis with the CBECS data for retail buildings to develop an equation (i.e., model) that controls for variations in building characteristics. The building characteristics that could be considered in the model are limited to those included in the CBECS data. For example, the number of refrigerated display cases is included in CBECS, while information on the tons of refrigeration is not collected.

Our benchmarking model was designed to take the general form shown in Equation 1:

EUI = Intercept + {Coefficients} x {Building Characteristics} (1)

Where:

EUI is Energy Use Intensity in units of kBtu/sq ft of source energy;

Intercept and Coefficients are estimated through regression analysis; and

Building Characteristics are data from CBECS that describe the buildings in the sample.

Energy use is expressed as "source energy" to reflect the energy required to deliver the energy to the building where it is consumed.[3] The conversion from energy consumed on site (at the building) to source energy is most significant for electricity, because on average, 3.34 Btus of energy are required to generate and transmit 1 Btu of electricity to a building. The ratios of source energy to site energy used in our analysis are presented in Exhibit 2.

Prior to performing the regression analysis, we examined the CBECS data for retail buildings to ensure it was adequate to support the development of the benchmarking model. The 2003 CBECS data include about 291 observations for buildings defined as retail. Of these, we found that 180 observations met our criteria for inclusion in this analysis.[4] These observations represent about 150,000 buildings nationwide. Using these data we examined a wide variety of building characteristics and operating conditions that may affect energy use. Through the use of regression analysis, EPA and ICF International identified those building characteristics that explain the variation in energy use per square foot among retail buildings.

Based on this regression analysis, 10 characteristics were identified as key explanatory variables that can be used to estimate the expected average source energy use intensity (KBtu/sf) in a retail store. Together these 10 characteristics explain 69 percent of the variability in source energy per square foot among retail stores. Exhibit 3 presents these 10 characteristics, along with the coefficients that are used to combine these characteristics according to the regression equation. Numerous additional variables were considered for the model, but were not found to be statistically significant in their ability to explain the variation in energy use among buildings. For example, the presence of a food preparation room, snack bar, cafeteria, or fast food was examined. However, these variables were not statistically significant in the regression analysis. On the other hand, the refrigeration variables were significant, and are consequently included in the model. In Section 2.3, we provide an example of how the model is applied to an individual building.

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[2] Information on CBECS is available at: http://www.eia.doe.gov/emeu/cbecs/contents.html.

[3] A description of source energy is available at: http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_benchmark_comm_bldgs.

[4] Observations were excluded from the analysis for several reasons. The building must be at least 5,000 square feet; at least 50% of the building space must be used for retail; must operate at least 30 hours per week; must operate for at least 10 months per year; and other factors.

2.2 Distribution of Performance of Buildings Nationally

To accomplish Task 2, EPA and ICF International developed a distribution of energy performance based on the actual energy consumption of retail buildings in the CBECS population. The same 180 observations used in the regression analysis were used to develop this distribution. In order to describe the distribution of energy performance among these buildings the following steps were followed:

- The regression model was applied to each of the 180 observations in the CBECS data.
- Some of the 180 buildings used more energy than predicted by the model, while others used less. The actual energy use intensity (EUI) of each CBECS observation was divided by its predicted EUI to calculate an efficiency ratio for each building. Lower efficiency ratios indicate that the building used less energy than predicted, and is consequently more efficient. Higher efficiency ratios indicate the opposite.
- The efficiency ratios were sorted from smallest to largest, and the percentile value of each ratio was calculated.[5] A smoothed curve was fit to the ratios and their percentiles to create a table of ratings from 1 to 100. The ratios and their associated ratings are presented in Exhibit 4.

As shown in the exhibit, low ratios receive high ratings. A ratio of 0.661 indicates that the building has an EUI that is 66.1% of the expected average EUI for buildings with similar characteristics. Such a building would get a rating of 75, meaning that it performs better than 75% of comparable buildings. A rating of 50 has a ratio of 0.945, meaning that the building uses 94.5% of the expected average for comparable buildings.

With the data in these exhibits, the proposed benchmarking model can be applied to eligible retail buildings. Exhibit 5 presents graphs of the ratings for the CBECS observations as a function of several variables. As shown in the exhibit, buildings of all sizes receive the full range of ratings, showing that ratings are not biased by building size. Similarly, results are shown by worker density, work hours, heating degree days, and cooling degree days. These graphs demonstrate that the model produces ratings that ***are not biased*** by these characteristics, demonstrating that the model controls for the impacts of these characteristics on energy use.

2.3 Application of the Proposed Benchmarking Methodology

Using the model developed from the CBECS data, we can evaluate individual retail buildings. The data for **[Company's Building 19]** are used in this example to demonstrate the application of the methodology.

- The characteristics for Building 19 are used to estimate the values for each of the variables in the model. These values are shown in Exhibit 6.
- The Centering Value is subtracted from the value for each variable. The Centering Value is the weighted average value for the variable in the CBECS dataset used to develop the model. The resulting Centered Value is shown in Exhibit 6 for each variable.
- The Model Coefficient for each variable is multiplied by the Centered Value. The resulting values are summed, along with the Intercept to calculate the estimated average source energy use intensity (EUI) in kBtu per square foot. Exhibit 6 shows that the estimated EUI for Building 19 is 220 kBtu/sq ft.
- The actual EUI for Building 19 is calculated from its actual energy use. Using the reported kWh of electricity and Therms of natural gas, the actual EUI is calculated as:
  - Electricity: 459,493 kWh x 3.413 kBtu/kWh * 3.34 Source-Site ratio / 29,603 sq ft
    = 176.9 kBtu/sq ft
  - Natural Gas: 3,397 Therms x 100 kBtu/Therm * 1.047 Source-Site ratio / 29,603 sq ft
    = 12.0 kBtu/sq ft

[5] The percentile values of the ratios were calculated using the individual observation weights from the CBECS dataset. The weights are used because each CBECS observation represents a different number of buildings.

The total actual EUI is therefore 188.9 kBtu/sq ft.

- The ratio of the actual EUI to the estimated EUI is 188.9/220 = 0.859. This value is the efficiency ratio for the building. The efficiency ratio is less than 1.0, meaning that the building uses less energy than the average expected for similar buildings nationally. Using the ratio of 0.859, the rating for the building is found in Exhibit 4 to be 58.

This rating of 58 means that Building 19 uses less energy than 58% of similar buildings. In order to achieve a rating of 75, the building would need to reduce its energy use. Using the information in Exhibit 4, if weather and operation remain constant, a 23% reduction in energy use would be required to achieve a rating of 75 and qualify for the ENERGY STAR label.

3. [Company] Performance

This section presents the ratings for the 61 buildings provided by **[Company]**. The necessary heating and cooling degree day data for each building were obtained from an EPA data set organized by ZIP code. All the data required to apply the model were complete for each of the 61 buildings, so that ratings were estimated for each building.

The results for the 61 buildings are presented in Exhibit 7. For each building, the characteristics used in the model are reported, along with the actual and estimated EUI, the efficiency ratio and the rating. Several characteristics were used for all of **[Company's]** buildings, including: operating hours of 80 hours per week; three PCs; no refrigeration; and 100% heated and cooled, so these values are not shown. The reported electricity and natural gas use per square foot are also included.

The buildings in the exhibit are sorted by rating, so that the highest rated buildings are at the top. The average rating is 52.5, and the distribution of ratings by percentile is as follows:

Average	5%	25%	Median	75%	95%	# Buildings
52.5	27.0	37.0	55.0	65.0	71.0	61

As this table shows, a rating of 65 represents the 75th percentile of performance. In other words, a building that receives a rating of 65 performs better than 75% of **[Company's]** buildings. Both the average and median rating are slightly above 50, meaning that on average the buildings are performing a little better than the average of similar buildings in the U.S. The distribution of ratings is tighter around the average than the ratings of all buildings, however. This tighter distribution is to be expected for an individual company if all the company's buildings share management practices and other features.

Exhibit 8 shows a graph of the ratings as a function of actual EUI. As expected, buildings with lower EUIs tend to have higher ratings. However, in the range of about 140 kBtu/sq ft to 200 kBtu/sq ft there is a broad range of ratings at any given level of EUI.

Exhibit 9 shows a graph of the frequency with which each rating is observed among **[Company's]** buildings. The graph shows that there are two peaks in the data, around a rating of 30 and between ratings of 60 and 70.

4. Comparison to Others

This section compares the ratings for **[Company's]** buildings with the full set of buildings for which data were provided. A total of 577 buildings were evaluated. The average and median ratings for all buildings are approximately 50, meaning that the buildings as a whole perform on average at about the same rate as all similar buildings in the U.S., as represented by the CBECS 2003 Data set. **[Company's]** buildings have a slightly higher average rating, although **Company** also has fewer buildings with very high or very low ratings. The distribution of ratings is as follows:

	Average	5%	25%	Median	75%	95%	# Bldgs
All Buildings Shared with ICF International	49.6	17.0	35.0	50.0	64.0	82.0	577
[Company] Buildings	52.5	27.0	37.0	55.0	65.0	71.0	61

Exhibit 10 presents several graphs that compare **[Company's]** building performance to all the buildings examined. **[Company's]** results are shown as blue circles, while the results for all other buildings are shown as black dashes.

As shown in the exhibit, **[Company's]** buildings tend to have lower energy use intensities (EUIs) compared to most of the other buildings. The frequencies of the ratings for all buildings also peak near a rating of 60, although there is not a second peak around a rating of 30.

Compared to other buildings, **[Company's]** buildings have a relatively low worker density (workers per 1,000 square feet). The weekly operating hours tend to fall between 60 and 100 hours per week for most of the buildings. Finally, both the **[Company's]** buildings and all the buildings are distributed along a broad range of heating and cooling degree days. The ratings do not appear to be strongly correlated with these weather data, indicating that the proposed benchmarking model properly controls for the impacts of weather on energy requirements.

5. Conclusion

The proposed benchmarking methodology for retail buildings was developed based on an analysis of 2003 CBECS data. ICF International applied this methodology to actual data received for approximately 600 buildings, as provided by nine retail organizations participating in the benchmark development effort. The average energy performance of these 600 buildings was found to be equivalent to the average performance of the buildings in the 2003 CBECS data.

The buildings for **[Company]** were rated slightly better on average, as compared with both the CBECS data set and the 600 retailer-supplied observations. Three of **[Company's]** buildings were rated particularly well, above 75. These buildings are estimated to perform better than 75% of similar buildings in the U.S. If the recommended benchmarking methodology were adopted in Portfolio Manager, these three buildings would be eligible to receive the ENERGY STAR label.

Exhibit 1: Example of Building Characteristics included in the 2003 CBECS Data
This list is a small portion of the CBECS variables.

Annual energy consumption by fuel type	Primary and secondary building activities
Number of months of operation	Hours per week of operation
Number of workers on the main shift	Number of personal computers
Number of cash registers	Number of refrigeration units by type
Number of copiers	Number of fax machines
Number of computer servers	Whether there is a mainframe computer room
Whether the building is part of a complex	Whether there is a snack bar, cafeteria, or fast food
Number of floors	Whether there is food preparation
Building size in square feet	Building shape
Portion of building heated	Portion of building cooled
Construction materials	Recent upgrades in building systems
Year of construction	Equipment types
Building use data (e.g., number of classroom seats in schools)	Statistical sampling data such as observation weight
Whether there is an indoor pool	Types of lighting used

Exhibit 2: Source to Site Ratios
Used to convert building energy consumption to common source energy units.

Fuel Type	Source to Site Ratio
Electricity	3.34
Natural Gas	1.047
Fuel Oil	1.01
District Steam	1.45
District Hot Water	1.35
Propane	1.01

Exhibit 3: Proposed Retail Benchmarking Model
Model estimated using regression analysis of CBECS data.
Centering Value is the weighted average value for the variable in the CBECS data used in the regression analysis.

Variable	Centering Value	Coefficient	t Statistic
Intercept	(NA)	154.81144	26.83
Ln(square feet)	9.3751	19.65506	2.08
Operating Hours per Week	63.7400	1.37196	3.23
Number or workers per 1,000 sq ft	0.6315	61.84407	3.96
Number of PCs per 1,000 sq ft	0.3174	70.15595	3.36
Heating degree days x % heated	3799.5038	0.01133	4.27
Cooling degree days x % cooled	992.1834	0.01186	1.60
Number of cash registers per 1,000 sq ft	0.1945	243.35557	7.00
Number of walk in refrigeration units per 1,000 sq ft	0.0035	843.06622	2.04
Number of open and closed refrigeration cases per 1,000 sq ft	0.0443	88.56331	1.95
Regression analysis of CBECS data, 180 observations. Adjusted R^2 = 0.69.			

Exhibit 4: Efficiency Ratios and Ratings Based on CBECS Analysis
Lower efficiency ratios indicate more efficient buildings and thus higher ratings.

Efficiency Ratio	Rating
<0.225	100
0.225	99
0.275	98
0.311	97
0.340	96
0.365	95
0.388	94
0.408	93
0.427	92
0.445	91
0.462	90
0.478	89
0.493	88
0.508	87
0.522	86
0.536	85
0.550	84
0.563	83
0.576	82
0.589	81
0.601	80
0.613	79
0.625	78
0.637	77
0.649	76
0.661	75
0.673	74
0.684	73
0.695	72
0.707	71
0.718	70
0.729	69
0.741	68
0.752	67
0.763	66
0.774	65
0.785	64
0.796	63
0.808	62
0.819	61
0.830	60
0.841	59
0.852	58
0.864	57
0.875	56
0.886	55
0.898	54
0.909	53
0.921	52
0.933	51
0.945	50
0.956	49
0.968	48
0.981	47
0.993	46
1.005	45
1.018	44
1.030	43
1.043	42
1.056	41
1.069	40
1.083	39
1.096	38
1.110	37
1.124	36
1.139	35
1.153	34
1.168	33
1.183	32
1.199	31
1.215	30
1.231	29
1.248	28
1.265	27
1.282	26
1.300	25
1.319	24
1.338	23
1.358	22
1.379	21
1.400	20
1.423	19
1.446	18
1.470	17
1.496	16
1.523	15
1.552	14
1.582	13
1.614	12
1.649	11
1.687	10
1.728	9
1.774	8
1.825	7
1.883	6
1.950	5
2.031	4
2.134	3
2.275	2
>2. 275	1

Exhibit 5: Graphs of CBECS Data Ratings
The ratings of the CBECS observations using the proposed model show good distributions of ratings across building characteristics.

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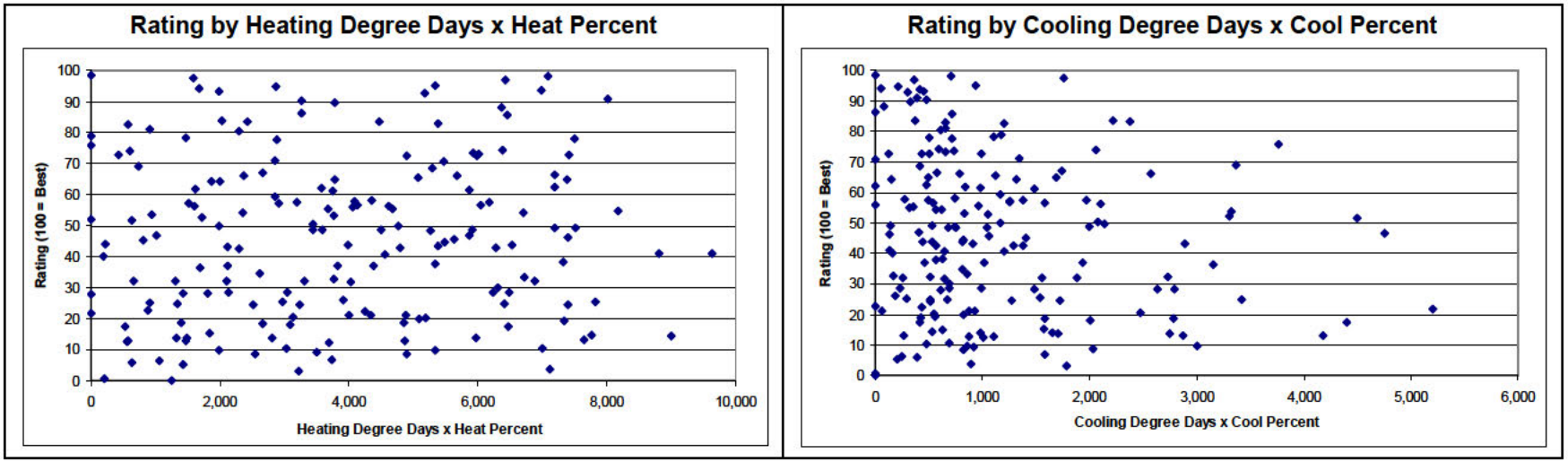

Exhibit 6: Estimated EUI for Building 19
Example calculation of the expected average source EUI for an individual building

Variable	Value	Centering Value	Centered Value	Model Coefficient	Estimate
Intercept	(NA)	(NA)	(NA)	154.81	154.81
Ln(sq ft)	10.3	9.3751	0.92	19.66	18.09
Work Hours	80	63.74	16.26	1.37	22.31
Workers/1,000 sq ft	0.405	0.6315	-0.226	61.84	-13.98
PCs/1,000 sq ft	0.101	0.3174	-0.216	70.16	-15.16
HDD x % heated	Redacted Ex 4	3,799.50	Redacted Ex 4	0.0113	Redacted Ex 4
CDD x % cooled	Redacted Ex 4	992.183	Redacted Ex 4	0.0119	Redacted Ex 4
Registers/1,000 sq ft	0.338	0.1945	0.143	243.36	34.88
Walk in refrig/1,000 sq ft	0	0.0035	-0.003	843.07	-2.94
Open/closed refrig/1,000 sq ft	0	0.0443	-0.044	88.56	-3.92
Total Estimated EUI (source kBtu/sq ft)					**220.34**

Exhibit 7: [Company] Data Sorted by Rating
This table shows the building characteristics used to estimate the rating for each building.

Store ID	kWh per Sq ft	Therms per Sq ft	Sq ft	HDD	CDD	Workers	# Cash Registers	Actual EUI (kBtu/sq ft)	EUI Est (kBtu/sq ft)	Efficiency Ratio	Rating
301	8.78	0.046	47,520	Redacted Ex 4	Redacted Ex 4	12	9	105	181	0.58	82
484	9.20	0.000	28,171	Redacted Ex 4	Redacted Ex 4	10	7	105	181	0.58	82
781	11.14	0.081	38,030	Redacted Ex 4	Redacted Ex 4	12	9	126	190	0.66	76
448	11.92	0.074	29,125	Redacted Ex 4	Redacted Ex 4	11	8	144	203	0.71	71
397	11.98	0.153	32,682	Redacted Ex 4	Redacted Ex 4	12	9	153	209	0.73	70
732	12.53	0.088	29,200	Redacted Ex 4	Redacted Ex 4	12	9	152	209	0.73	70
871	12.30	0.120	28,280	Redacted Ex 4	Redacted Ex 4	12	9	153	211	0.72	70
494	10.70	0.151	32,919	Redacted Ex 4	Redacted Ex 4	11	8	138	187	0.74	69
528	11.46	0.269	30,010	Redacted Ex 4	Redacted Ex 4	12	9	159	215	0.74	69
616	12.17	0.080	56,093	Redacted Ex 4	Redacted Ex 4	16	14	147	197	0.75	68
750	11.34	0.017	30,338	Redacted Ex 4	Redacted Ex 4	12	9	131	176	0.74	68
780	11.84	0.113	29,775	Redacted Ex 4	Redacted Ex 4	10	7	147	195	0.75	68
423	12.90	0.109	28,232	Redacted Ex 4	Redacted Ex 4	11	8	158	210	0.75	67
727	13.05	0.212	26,500	Redacted Ex 4	Redacted Ex 4	12	9	171	226	0.76	67

Exhibit 7: [Company] Data Sorted by Rating
This table shows the building characteristics used to estimate the rating for each building.

Store ID	kWh per Sq ft	Therms per Sq ft	Sq ft	HDD	CDD	Workers	# Cash Registers	Actual EUI (kBtu/sq ft)	EUI Est (kBtu/sq ft)	Efficiency Ratio	Rating
762	10.84	0.093	31,013	Redacted Ex 4	Redacted Ex 4	10	7	133	172	0.77	66
312	10.80	0.141	41,065	Redacted Ex 4	Redacted Ex 4	12	9	138	177	0.78	65
360	11.74	0.121	30,798	Redacted Ex 4	Redacted Ex 4	10	7	146	189	0.78	65
770	11.58	0.123	30,471	Redacted Ex 4	Redacted Ex 4	10	7	145	183	0.79	64
164	13.42	0.036	30,054	Redacted Ex 4	Redacted Ex 4	11	8	157	192	0.81	62
297	12.75	0.143	27,160	Redacted Ex 4	Redacted Ex 4	11	8	160	197	0.81	62
719	13.31	0.050	30,000	Redacted Ex 4	Redacted Ex 4	12	9	157	193	0.81	62
355	13.39	0.194	28,600	Redacted Ex 4	Redacted Ex 4	12	9	176	212	0.83	61
721	13.50	0.219	29,225	Redacted Ex 4	Redacted Ex 4	11	8	177	213	0.83	61
848	13.58	0.144	32,813	Redacted Ex 4	Redacted Ex 4	12	9	170	205	0.83	61
825	11.23	0.220	35,008	Redacted Ex 4	Redacted Ex 4	11	8	151	182	0.83	60
19	15.52	0.115	29,603	Redacted Ex 4	Redacted Ex 4	12	10	189	220	0.86	58
163	13.17	0.232	32,100	Redacted Ex 4	Redacted Ex 4	12	9	174	202	0.87	57
580	13.37	0.206	29,838	Redacted Ex 4	Redacted Ex 4	10	7	174	199	0.87	57

Exhibit 7: [Company] Data Sorted by Rating
This table shows the building characteristics used to estimate the rating for each building.

Store ID	kWh per Sq ft	Therms per Sq ft	Sq ft	HDD	CDD	Workers	# Cash Registers	Actual EUI (kBtu/sq ft)	EUI Est (kBtu/sq ft)	Efficiency Ratio	Rating
373	14.28	0.160	29,006	Redacted Ex 4	Redacted Ex 4	12	9	180	201	0.89	55
503	13.75	0.092	31,124	Redacted Ex 4	Redacted Ex 4	11	8	166	187	0.89	55
754	13.90	0.081	36,966	Redacted Ex 4	Redacted Ex 4	11	8	167	186	0.90	55
758	13.35	0.102	36,390	Redacted Ex 4	Redacted Ex 4	11	8	163	183	0.89	55
764	13.15	0.092	29,931	Redacted Ex 4	Redacted Ex 4	10	7	160	179	0.89	55
782	14.30	0.213	25,397	Redacted Ex 4	Redacted Ex 4	10	7	185	203	0.91	53
828	15.14	0.266	28,622	Redacted Ex 4	Redacted Ex 4	12	9	200	217	0.92	52
453	13.21	0.161	31,814	Redacted Ex 4	Redacted Ex 4	10	7	167	179	0.94	51
539	12.78	0.041	35,082	Redacted Ex 4	Redacted Ex 4	10	7	150	161	0.93	51
45	15.79	0.107	30,115	Redacted Ex 4	Redacted Ex 4	12	9	191	202	0.95	50
144	13.84	0.072	33,976	Redacted Ex 4	Redacted Ex 4	11	8	165	174	0.95	50
759	14.74	0.211	26,526	Redacted Ex 4	Redacted Ex 4	10	7	190	198	0.96	49
184	14.78	0.227	29,753	Redacted Ex 4	Redacted Ex 4	10	6	192	194	0.99	47
326	15.96	0.130	27,948	Redacted Ex 4	Redacted Ex 4	11	8	196	197	0.99	47

Exhibit 7: [Company] Data Sorted by Rating
This table shows the building characteristics used to estimate the rating for each building.

Store ID	kWh per Sq ft	Therms per Sq ft	Sq ft	HDD	CDD	Workers	# Cash Registers	Actual EUI (kBtu/sq ft)	EUI Est (kBtu/sq ft)	Efficiency Ratio	Rating
814	15.02	0.272	29,499	Redacted Ex 4	Redacted Ex 4	10	7	200	194	1.03	43
140	16.96	0.019	33,542	Redacted Ex 4	Redacted Ex 4	11	8	195	187	1.04	42
433	15.59	0.000	33,423	Redacted Ex 4	Redacted Ex 4	14	12	178	166	1.07	40
44	16.56	0.099	31,422	Redacted Ex 4	Redacted Ex 4	10	7	199	178	1.12	37
775	15.54	0.054	30,000	Redacted Ex 4	Redacted Ex 4	10	7	183	163	1.12	37
818	16.02	0.001	29,952	Redacted Ex 4	Redacted Ex 4	10	7	183	161	1.13	36
363	17.31	0.023	27,215	Redacted Ex 4	Redacted Ex 4	11	8	200	175	1.14	35
752	18.44	0.107	36,915	Redacted Ex 4	Redacted Ex 4	11	8	221	194	1.14	35
366	14.54	0.537	33,560	Redacted Ex 4	Redacted Ex 4	10	7	222	189	1.18	33
336	14.51	0.001	25,929	Redacted Ex 4	Redacted Ex 4	10	7	166	139	1.19	32
604	12.53	0.000	34,636	Redacted Ex 4	Redacted Ex 4	10	7	143	120	1.19	32
269	18.23	0.004	23,845	Redacted Ex 4	Redacted Ex 4	12	9	208	172	1.21	31
70	12.03	0.004	40,127	Redacted Ex 4	Redacted Ex 4	10	7	138	113	1.22	30
654	13.88	0.000	34,641	Redacted Ex 4	Redacted Ex 4	11	8	158	129	1.23	30

Exhibit 7: [Company] Data Sorted by Rating
This table shows the building characteristics used to estimate the rating for each building.

Store ID	kWh per Sq ft	Therms per Sq ft	Sq ft	HDD	CDD	Workers	# Cash Registers	Actual EUI (kBtu/sq ft)	EUI Est (kBtu/sq ft)	Efficiency Ratio	Rating
344	19.18	0.113	26,626	Redacted Ex 4	Redacted Ex 4	10	7	230	186	1.24	29
454	18.15	0.223	30,840	Redacted Ex 4	Redacted Ex 4	10	7	230	181	1.28	27
180	14.18	0.000	32,653	Redacted Ex 4	Redacted Ex 4	10	7	162	123	1.31	25
310	16.31	0.001	24,985	Redacted Ex 4	Redacted Ex 4	10	7	186	142	1.31	25
73	14.96	0.008	42,875	Redacted Ex 4	Redacted Ex 4	11	8	171	117	1.46	18

Exhibit 8: Graph of Actual EUI vs. Rating for [Company]
Higher ratings are generally associated with lower EUI values.
However, some buildings appear to have ratings below others with similar EUI values.

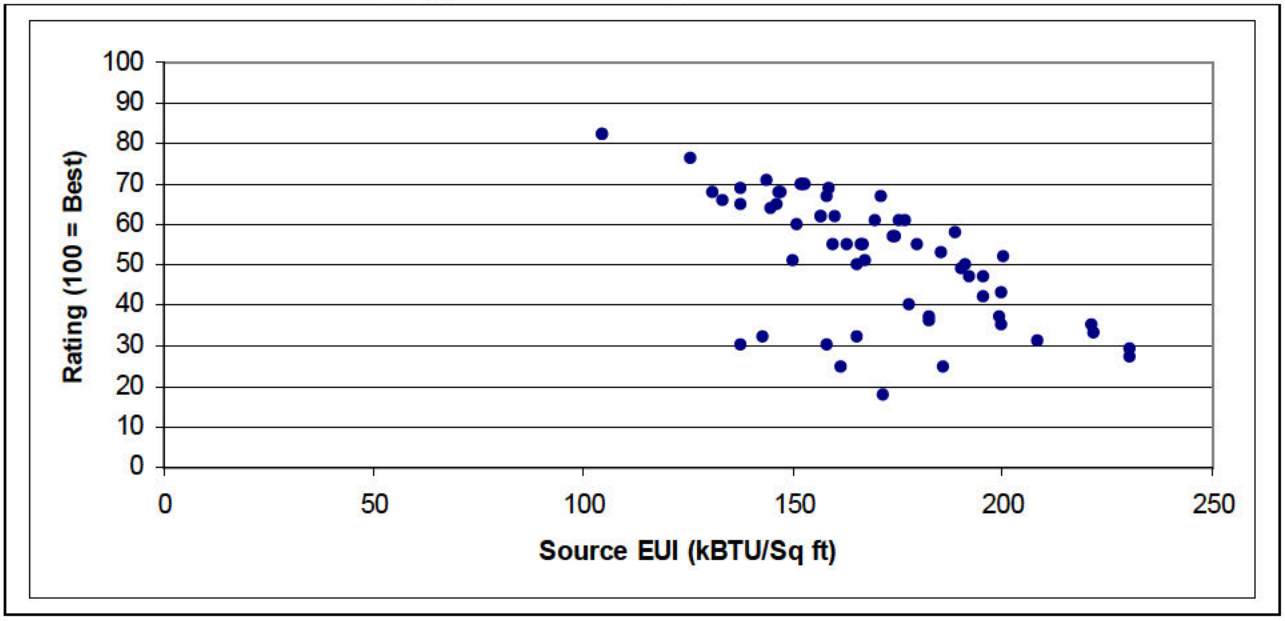

Exhibit 9: Rating Frequency for [Company]

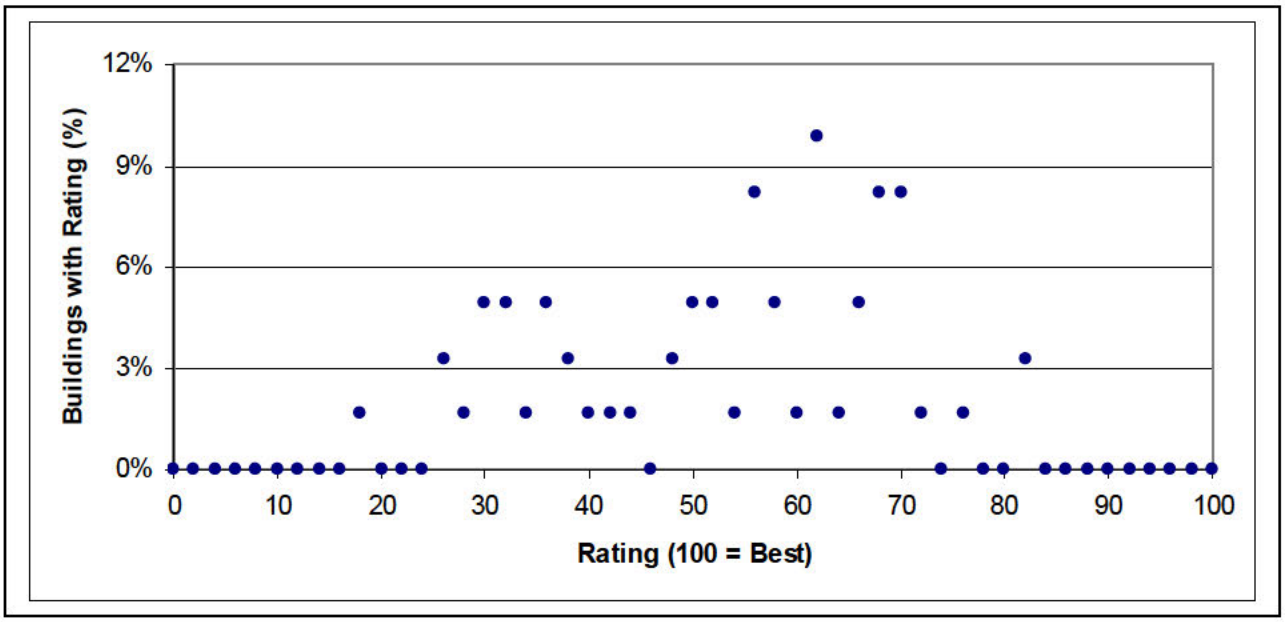

Exhibit 10: [Company] Performance Compared to All Reported Buildings
[Company] data shown as blue circles. Other reported buildings shown as black dashes.

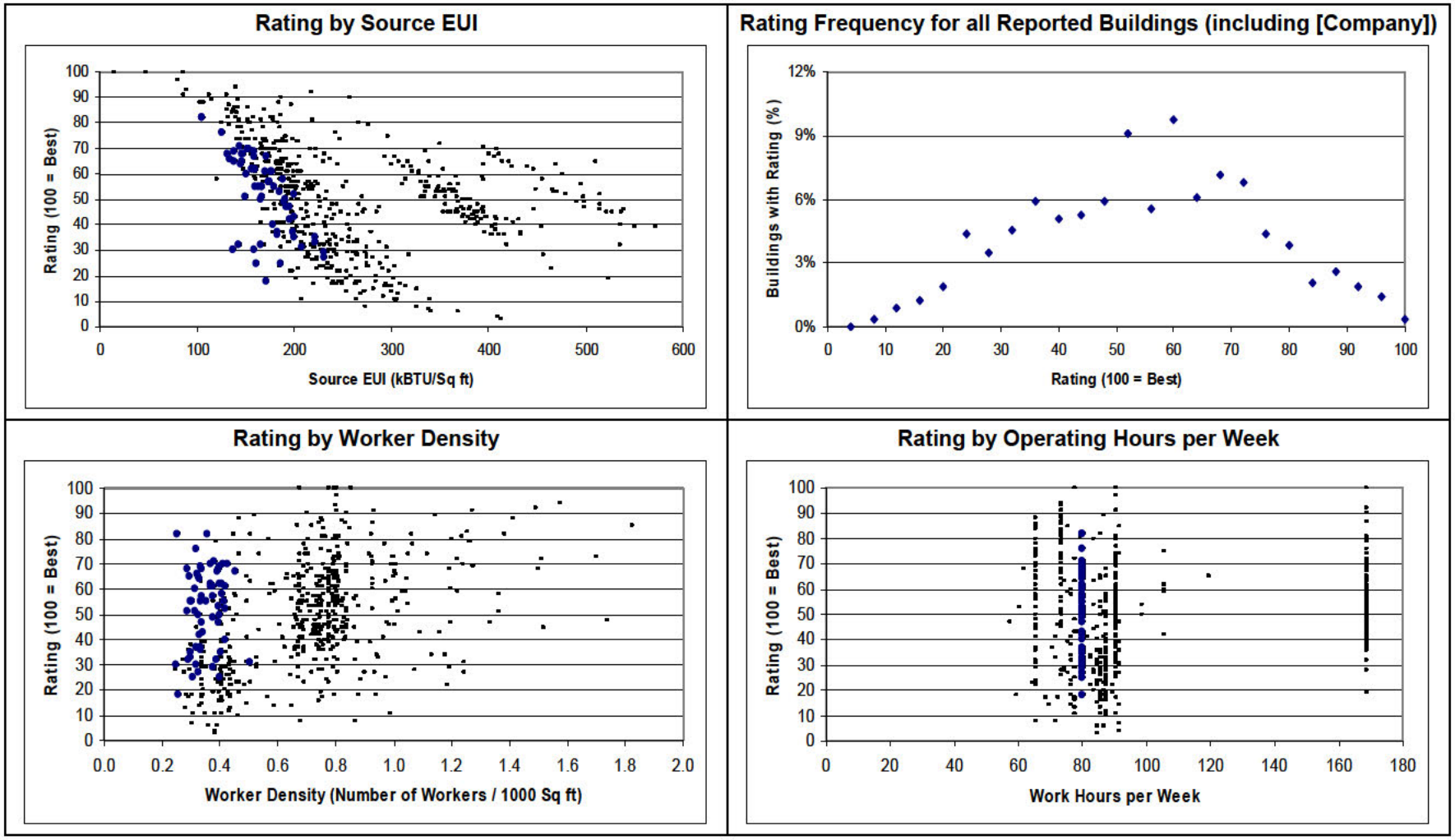

Exhibit 10: [Company] Performance Compared to All Reported Buildings
[Company] data shown as blue circles. Other reported buildings shown as black dashes.